

## SEQUENCE LISTING

<110> United States Army Medical Research Institute of  
Infectious Diseases  
Hart, Mary Katherine  
Wilson, Julie A.  
Pushko, Peter  
Smith, Jonathan F.  
Schmaljohn, Alan L.

<120> Ebola Virion Proteins Expressed from Venezuelan Equine Encephalitis (VEE)  
Virus Replicons

<130> Army 144

<140> US Ser. No. 09/337,946

<141> 1999-06-22

<150> US 60/091,403

<151> 1998-06-29

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Leu Val Cys Arg Asp Lys Leu Ser Ser Thr  
55 60  
Asn Gln Leu Arg Ser Val Gly Leu Asn Leu  
65 70  
Glu Gly Asn Gly Val Ala Thr Asp Val Pro  
75 80  
Ser Ala Thr Lys Arg Trp Gly Phe Arg Ser  
85 90  
Gly Val Pro Pro Lys Val Val Asn Tyr Glu  
95 100  
Ala Gly Glu Trp Ala Glu Asn Cys Tyr Asn  
105 110  
Leu Glu Ile Lys Lys Pro Asp Gly Ser Glu  
115 120



Cys Leu Pro Ala Ala Pro Asp Gly Ile Arg	
	125 130
Gly Phe Pro Arg Cys Arg Tyr Val His Lys	
	135 140
Val Ser Gly Thr Gly Pro Cys Ala Gly Asp	
	145 150
Phe Ala Phe His Lys Glu Gly Ala Phe Phe	
	155 160
Leu Tyr Asp Arg Leu Ala Ser Thr Val Ile	
	165 170
Tyr Arg Gly Thr Thr Phe Ala Glu Gly Val	
	175 180
Val Ala Phe Leu Ile Leu Pro Gln Ala Lys	
	185 190
Lys Asp Phe Phe Ser Ser His Pro Leu Arg	
	195 200
Glu Pro Val Asn Ala Thr Glu Asp Pro Ser	
	205 210
Ser Gly Tyr Tyr Ser Thr Thr Ile Arg Tyr	
	215 220
Gln Ala Thr Gly Phe Gly Thr Asn Glu Thr	
	225 230
Glu Tyr Leu Phe Glu Val Asp Asn Leu Thr	
	235 240
Tyr Val Gln Leu Glu Ser Arg Phe Thr Pro	
	245 250
Gln Phe Leu Leu Gln Leu Asn Glu Thr Ile	
	255 260
Tyr Thr Ser Gly Lys Arg Ser Asn Thr Thr	
	265 270
Gly Lys Leu Ile Trp Lys Val Asn Pro Glu	
	275 280
Ile Asp Thr Thr Ile Gly Glu Trp Ala Phe	
	285 290
Trp Glu Thr Lys Lys Asn Leu Thr Arg Lys	
	295 300
Ile Arg Ser Glu Glu Leu Ser Phe Thr Val	
	305 310

Val Ser Asn Gly Ala Lys Asn Ile Ser Gly	
Gln Ser Pro Ala Arg Thr Ser Ser Asp Pro	
	325 330
Gly Thr Asn Thr Thr Thr Glu Asp His Lys	
	335 340
Ile Met Ala Ser Glu Asn Ser Ser Ala Met	
	345 350
Val Gln Val His Ser Gln Gly Arg Glu Ala	
	355 360
Ala Val Ser His Leu Thr Thr Leu Ala Thr	
	365 370
Ile Ser Thr Ser Pro Gln Ser Leu Thr Thr	
	375 380
Lys Pro Gly Pro Asp Asn Ser Thr His Asn	
	385 390
Thr Pro Val Tyr Lys Leu Asp Ile Ser Glu	
	395 400
Ala Thr Gln Val Glu Gln His His Arg Arg	

315

320

	405		410
Thr Asp Asn Asp Ser Thr Ala Ser Asp Thr			
	415		420
Pro Ser Ala Thr Thr Ala Ala Gly Pro Pro			
	425		430
Lys Ala Glu Asn Thr Asn Thr Ser Lys Ser			
	435		440
Thr Asp Phe Leu Asp Pro Ala Thr Thr Thr			
	445		450
Ser Pro Gln Asn His Ser Glu Thr Ala Gly			
	455		460
Asn Asn Asn Thr His His Gln Asp Thr Gly			
	465		470
Glu Glu Ser Ala Ser Ser Gly Lys Leu Gly			
	475		480
Leu Ile Thr Asn Thr Ile Ala Gly Val Ala			
	485		490
Gly Leu Ile Thr Gly Gly Arg Arg Thr Arg			
	495		500
Arg Glu Ala Ile Val Asn Ala Gln Pro Lys			
	505		510
Cys Asn Pro Asn Leu His Tyr Trp Thr Thr			
	515		520
Gln Asp Glu Gly Ala Ala Ile Gly Leu Ala			
	525		530
Trp Ile Pro Tyr Phe Gly Pro Ala Ala Glu			
	535		540
Gly Ile Tyr Ile Glu Gly Leu Met His Asn			
	545		550
Gln Asp Gly Leu Ile Cys Gly Leu Arg Gln			
	555		560
Leu Ala Asn Glu Thr Thr Gln Ala Leu Gln			
	565		570
Leu Phe Leu Arg Ala Thr Thr Glu Leu Arg			
	575		580
Thr Phe Ser Ile Leu Asn Arg Lys Ala Ile			
	585		590
Asp Phe Leu Leu Gln Arg Trp Gly Gly Thr			
	595		600
Cys His Ile Leu Gly Pro Asp Cys Cys Ile			
	605		610
Glu Pro His Asp Trp Thr Lys Asn Ile Thr			
	615		620
Asp Lys Ile Asp Gln Ile Ile His Asp Phe			
	625		630
Val Asp Lys Thr Leu Pro Asp Gln Gly Asp			
	635		640
Asn Asp Asn Trp Trp Thr Gly Trp Arg Gln			
	645		650
Trp Ile Pro Ala Gly Ile Gly Val Thr Gly			
	655		660
Val Val Ile Ala Val Ile Ala Leu Phe Cys			
	665		670
Ile Cys Lys Phe Val Phe			
	675		

<211> 739

<212> PRT

<213> Ebola Zaire

<400> 18

Met	Asp	Ser	Arg	Pro	Gln	Lys	Ile	Trp	Met	
1				5					10	
Ala	Pro	Ser	Leu	Thr	Glu	Ser	Asp	Met	Asp	
				15					20	
Tyr	His	Lys	Ile	Leu	Thr	Ala	Gly	Leu	Ser	
				25					30	
Val	Gln	Gln	Gly	Ile	Val	Arg	Gln	Arg	Val	
				35					40	
Ile	Pro	Val	Tyr	Gln	Val	Asn	Asn	Leu	Glu	
				45					50	
Glu	Ile	Cys	Gln	Leu	Ile	Ile	Gln	Ala	Phe	
				55					60	
Glu	Ala	Gly	Val	Asp	Phe	Gln	Glu	Ser	Ala	
				65					70	
Asp	Ser	Phe	Leu	Leu	Met	Leu	Cys	Leu	His	
				75					80	
His	Ala	Tyr	Gln	Gly	Asp	Tyr	Lys	Leu	Phe	
				85					90	
Leu	Glu	Ser	Gly	Ala	Val	Lys	Tyr	Leu	Glu	
				95					100	
Gly	His	Gly	Phe	Arg	Phe	Glu	Val	Lys	Lys	
				105					110	
Arg	Asp	Gly	Val	Lys	Arg	Leu	Glu	Glu	Leu	
				115					120	
Leu	Pro	Ala	Val	Ser	Ser	Gly	Lys	Asn	Ile	
				125					130	
Lys	Arg	Thr	Leu	Ala	Ala	Met	Pro	Glu	Glu	
				135					140	
Glu	Thr	Thr	Glu	Ala	Asn	Ala	Gly	Gln	Phe	
				145					150	
Leu	Ser	Phe	Ala	Ser	Leu	Phe	Leu	Pro	Lys	
				155					160	
Leu	Val	Val	Gly	Glu	Lys	Ala	Cys	Leu	Glu	
				165					170	
Lys	Val	Gln	Arg	Gln	Ile	Gln	Val	His	Ala	
				175					180	
Glu	Gln	Gly	Leu	Ile	Gln	Tyr	Pro	Thr	Ala	
				185					190	
Trp	Gln	Ser	Val	Gly	His	Met	Met	Val	Ile	
				195					200	
Phe	Arg	Leu	Met	Arg	Thr	Asn	Phe	Leu	Ile	
				205					210	
Lys	Phe	Leu	Leu	Ile	His	Gln	Gly	Met	His	
				215					220	
Met	Val	Ala	Gly	His	Asp	Ala	Asn	Asp	Ala	
				225					230	
Val	Ile	Ser	Asn	Ser	Val	Ala	Gln	Ala	Arg	
				235					240	
Phe	Ser	Gly	Leu	Leu	Ile	Val	Lys	Thr	Val	
				245					250	
Leu	Asp	His	Ile	Leu	Gln	Lys	Thr	Glu	Arg	
				255					260	
Gly	Val	Arg	Leu	His	Pro	Leu	Ala	Arg	Thr	

Ala Lys Val Lys	265	Asn Glu Val Asn Ser Phe	270
Lys Ala Ala Leu	275	Ser Ser Leu Ala Lys His	280
Gly Glu Tyr Ala	285	Pro Phe Ala Arg Leu Leu	290
Asn Leu Ser Gly	295	Val Asn Asn Leu Glu His	300
Gly Leu Phe Pro	305	Gln Leu Ser Ala Ile Ala	310
Leu Gly Val Ala	315	Thr Ala His Gly Ser Thr	320
Leu Ala Gly Val	325	Asn Val Gly Glu Gln Tyr	330
Gln Gln Leu Arg	335	Glu Ala Ala Thr Glu Ala	340
Glu Lys Gln Leu	345	Gln Gln Tyr Ala Glu Ser	350
Arg Glu Leu Asp	355	His Leu Gly Leu Asp Asp	360
Gln Glu Lys Lys	365	Ile Leu Met Asn Phe His	370
Gln Lys Lys Asn	375	Glu Ile Ser Phe Gln Gln	380
Thr Asn Ala Met	385	Val Thr Leu Arg Lys Glu	390
Arg Leu Ala Lys	395	Leu Thr Glu Ala Ile Thr	400
Ala Ala Ser Leu	405	Pro Lys Thr Ser Gly His	410
Tyr Asp Asp Asp	415	Asp Asp Ile Pro Phe Pro	420
Gly Pro Ile Asn	425	Asp Asp Asp Asn Pro Gly	430
His Gln Asp Asp	435	Asp Asp Asp Asn Pro Gly	440
450Asp Thr Thr		Ile Pro Asp Val Val Val Asp	
460Pro Asp Asp		Gly Ser Tyr Gly Glu Tyr Gln	
Ser Tyr Ser Glu	465	Asn Gly Met Asn Ala Pro	470
Asp Asp Leu Val	475	Leu Phe Asp Leu Asp Glu	480
Asp Asp Glu Asp	485	Thr Lys Pro Val Pro Asn	490
Arg Ser Thr Lys	495	Gly Gly Gln Gln Lys Asn	500
Ser Gln Lys Gly	505	Gln His Ile Glu Gly Arg	510
Gln Thr Gln Ser	515	Arg Pro Ile Gln Asn Val	520
Pro Gly Pro His	525	Arg Thr Ile His His Ala	530
Ser Ala Pro Leu	535	Thr Asp Asn Asp Arg Arg	540
Asn Glu Pro Ser	545	Gly Ser Thr Ser Pro Arg	550
	555		560

445

455

Met Leu Thr Pro Ile Asn Glu Glu Ala Asp  
 565 570  
 Pro Leu Asp Asp Ala Asp Asp Glu Thr Ser  
 575 580  
 Ser Leu Pro Pro Leu Glu Ser Asp Asp Glu  
 585 590  
 Glu Gln Asp Arg Asp Gly Thr Ser Asn Arg  
 595 600  
 Thr Pro Thr Val Ala Pro Pro Ala Pro Val  
 605 610  
 Tyr Arg Asp His Ser Glu Lys Lys Glu Leu  
 615 620  
 Pro Gln Asp Glu Gln Gln Asp Gln Asp His  
 625 630  
 Thr Gln Glu Ala Arg Asn Gln Asp Ser Asp  
 635 640  
 Asn Thr Gln Ser Glu His Ser Phe Glu Glu  
 645 650  
 Met Tyr Arg His Ile Leu Arg Ser Gln Gly  
 655 660  
 Pro Phe Asp Ala Val Leu Tyr Tyr His Met  
 665 670  
 Met Lys Asp Glu Pro Val Val Phe Ser Thr  
 675 680  
 Ser Asp Gly Lys Glu Tyr Thr Tyr Pro Asp  
 685 690  
 Ser Leu Glu Glu Glu Tyr Pro Pro Trp Leu  
 695 700  
 Thr Glu Lys Glu Ala Met Asn Glu Glu Asn  
 705 710  
 Arg Phe Val Thr Leu Asp Gly Gln Gln Phe  
 715 720  
 Tyr Trp Pro Val Met Asn His Lys Asn Lys  
 730 Phe Met Ala Ile Leu Gln His His Gln  
 <210> 19  
 <211> 251  
 <212> PRT  
 <213> Ebola Zaire  
 <400> 19  
 Met Ala Lys Ala Thr Gly Arg Tyr Asn Leu  
 1 5 10  
 Ile Ser Pro Lys Lys Asp Leu Glu Lys Gly  
 15 20  
 Val Val Leu Ser Asp Leu Cys Asn Phe Leu  
 25 30  
 Val Ser Gln Thr Ile Gln Gly Trp Lys Val  
 35 40  
 Tyr Trp Ala Gly Ile Glu Phe Asp Val Thr  
 45 50  
 His Lys Gly Met Ala Leu Leu His Arg Leu  
 55 60  
 Lys Thr Asn Asp Phe Ala Pro Ala Trp Ser  
 65 70  
 Met Thr Arg Asn Leu Phe Pro His Leu Phe  
 75 80  
 Gln Asn Pro Asn Ser Thr Ile Glu Ser Pro  
 85 90

725  
 735

Leu Trp Ala Leu Arg Val Ile Leu Ala Ala	95	100
Gly Ile Gln Asp Gln Leu Ile Asp Gln Ser	105	110
Leu Ile Glu Pro Leu Ala Gly Ala Leu Gly	115	120
Leu Ile Ser Asp Trp Leu Leu Thr Thr Asn	125	130
Thr Asn His Phe Asn Met Arg Thr Gln Arg	135	140
Val Lys Glu Gln Leu Ser Leu Lys Met Leu	145	150
Ser Leu Ile Arg Ser Asn Ile Leu Lys Phe	155	160
Ile Asn Lys Leu Asp Ala Leu His Val Val	165	170
Asn Tyr Asn Gly Leu Leu Ser Ser Ile Glu	175	180
Ile Gly Thr Gln Asn His Thr Ile Ile Ile	185	190
Thr Arg Thr Asn Met Gly Phe Leu Val Glu	195	200
Leu Gln Glu Pro Asp Lys Ser Ala Met Asn	205	210
Arg Met Lys Pro Gly Pro Ala Lys Phe Ser	215	220
Leu Leu His Glu Ser Thr Leu Lys Ala Phe	225	230
Thr Gln Gly Ser Ser Thr Arg Met Gln Ser	235	240
Leu Ile Leu Glu Phe Asn Ser Ser Leu Ala	245	250
Ile		

<210> 20

<211> 324

<212> PRT

<213> Ebola Zaire

<400> 20

Met Glu Ala Ser Tyr Glu Arg Gly Arg Pro	1	5	10
Arg Ala Ala Arg Gln His Ser Arg Asp Gly	15		20
His Asp His His Val Arg Ala Arg Ser Ser	25		30
Ser Arg Glu Asn Tyr Arg Gly Glu Tyr Arg	35		40
Gln Ser Arg Ser Ala Ser Gln Val Arg Val	45		50
Pro Thr Val Phe His Lys Lys Arg Val Glu	55		60
Pro Leu Thr Val Pro Pro Ala Pro Lys Asp	65		70
Ile Cys Pro Thr Leu Lys Lys Gly Phe Leu	75		80
Cys Asp Ser Ser Phe Cys Lys Lys Asp His			

Gln Leu Glu Ser	85	Leu Thr Asp Arg Glu Leu	90
	95		100
Leu Leu Leu Ile	105	Ala Arg Lys Thr Cys Gly	110
Ser Val Glu Gln	115	Gln Leu Asn Ile Thr Ala	120
Pro Lys Asp Ser	125	Arg Leu Ala Asn Pro Thr	130
Ala Asp Asp Phe	135	Gln Gln Glu Glu Gly Pro	140
Lys Ile Thr Leu	145	Leu Thr Leu Ile Lys Thr	150
Ala Glu His Trp	155	Ala Arg Gln Asp Ile Arg	160
Thr Ile Glu Asp	165	Ser Lys Leu Arg Ala Leu	170
Leu Thr Leu Cys	175	Ala Val Met Thr Arg Lys	180
Phe Ser Lys Ser	185	Gln Leu Ser Leu Leu Cys	190
Glu Thr His Leu	195	Arg Arg Glu Gly Leu Gly	200
Gln Asp Gln Ala	205	Glu Pro Val Leu Glu Val	210
Tyr Gln Arg Leu	215	His Ser Asp Lys Gly Gly	220
Ser Phe Glu Ala	225	Ala Leu Trp Gln Gln Trp	230
Asp Leu Gln Ser	235	Leu Ile Met Phe Ile Thr	240
Ala Phe Leu Asn	245	Ile Ala Leu Gln Leu Pro	250
Cys Glu Ser Ser	255	Ala Val Val Val Ser Gly	260
Leu Arg Thr Leu	265	Val Pro Gln Ser Asp Asn	270
Glu Glu Ala Ser	275	Thr Asn Pro Gly Thr Cys	280
Ser Trp Ser Asp	285	Glu Gly Thr Ser Ile Gln	290
Gln Gln Leu Ala	295	Ser Cys Leu His Arg Thr	300
Arg Gly Asp Trp	305	His Ala Ala Leu Lys Phe	310
Leu Phe Tyr Phe	315	Ser Phe Leu Phe Arg Ile	320
Gly Phe Cys Phe			

<210> 21

<211> 340

<212> PRT

<213> Ebola Zaire

<400> 21

Met Thr Thr Arg Thr Lys Gly Arg Gly His

1	5	10
Thr Ala Ala Thr	Thr Gln Asn Asp Arg Met	
15	20	
Pro Gly Pro Glu	Leu Ser Gly Trp Ile Ser	
25	30	
Glu Gln Leu Met	Thr Gly Arg Ile Pro Val	
35	40	
Ser Asp Ile Phe	Cys Asp Ile Glu Asn Asn	
45	50	
Pro Gly Leu Cys	Tyr Ala Ser Gln Met Gln	
55	60	
Gln Thr Lys Pro	Asn Pro Lys Thr Arg Asn	
65	70	
Ser Gln Thr Gln	Thr Asp Pro Ile Cys Asn	
75	80	
His Ser Phe Glu	Glu Val Val Gln Thr Leu	
85	90	
Ala Ser Leu Ala	Thr Val Val Gln Gln Gln	
95	100	
Thr Ile Ala Ser	Glu Ser Leu Glu Gln Arg	
105	110	
Ile Thr Ser Leu	Glu Asn Gly Leu Lys Pro	
115	120	
Val Tyr Asp Met	Ala Lys Thr Ile Ser Ser	
125	130	
Leu Asn Arg Val	Cys Ala Glu Met Val Ala	
140	Lys Tyr Asp Leu Leu Val Met Thr Thr Gly	
150		
Arg Ala Thr Ala	Thr Ala Ala Ala Thr Glu	
155	160	
Ala Tyr Trp Ala	Glu His Gly Gln Pro Pro	
165	170	
Pro Gly Pro Ser	Leu Tyr Glu Glu Ser Ala	
175	180	
Ile Arg Gly Lys	Ile Glu Ser Arg Asp Glu	
185	190	
Thr Val Pro Gln	Ser Val Arg Glu Ala Phe	
195	200	
Asn Asn Leu Asn	Ser Thr Thr Ser Leu Thr	
205	210	
Glu Glu Asn Phe	Gly Lys Pro Asp Ile Ser	
215	220	
Ala Lys Asp Leu	Arg Asn Ile Met Tyr Asp	
225	230	
His Leu Pro Gly	Phe Gly Thr Ala Phe His	
235	240	
Gln Leu Val Gln	Val Ile Cys Lys Leu Gly	
245	250	
Lys Asp Ser Asn	Ser Leu Asp Ile Ile His	
255	260	
Ala Glu Phe Gln	Ala Ser Leu Ala Glu Gly	
265	270	
Asp Ser Pro Gln	Cys Ala Leu Ile Gln Ile	
275	280	
Thr Lys Arg Val	Pro Ile Phe Gln Asp Ala	
285	290	
Ala Pro Pro Val	Ile His Ile Arg Ser Arg	

135

145



	295	300
Gly Asp Ile Pro Arg Ala Cys Gln Lys Ser		
	305	310
Leu Arg Pro Val Pro Pro Ser Pro Lys Ile		
	315	320
Asp Arg Gly Trp Val Cys Val Phe Gln Leu		
	325	330
Gln Asp Gly Lys Thr Leu Gly Leu Lys Ile		
	335	340

<210> 22

<211> 326

<212> PRT

<213> Ebola Zaire

<400> 22

Met Arg Arg Val Ile Leu Pro Thr Ala Pro	
1 5 10	
Pro Glu Tyr Met Glu Ala Ile Tyr Pro Val	
15 20	
Arg Ser Asn Ser Thr Ile Ala Arg Gly Gly	
25 30	
Asn Ser Asn Thr Gly Phe Leu Thr Pro Glu	
40Ser Val Asn Gly Asp Thr Pro Ser Asn Pro	
45 50	
Leu Arg Pro Ile Ala Asp Asp Thr Ile Asp	
55 60	
His Ala Ser His Thr Pro Gly Ser Val Ser	
65 70	
Ser Ala Phe Ile Leu Glu Ala Met Val Asn	
75 80	
Val Ile Ser Gly Pro Lys Val Leu Met Lys	
85 90	
Gln Ile Pro Ile Trp Leu Pro Leu Gly Val	
95 100	
Ala Asp Gln Lys Thr Tyr Ser Phe Asp Ser	
105 110	
Thr Thr Ala Ala Ile Met Leu Ala Ser Tyr	
115 120	
Thr Ile Thr His Phe Gly Lys Ala Thr Asn	
125 130	
Pro Leu Val Arg Val Asn Arg Leu Gly Pro	
135 140	
Gly Ile Pro Asp His Pro Leu Arg Leu Leu	
145 150	
Arg Ile Gly Asn Gln Ala Phe Leu Gln Glu	
155 160	
Phe Val Leu Pro Pro Val Gln Leu Pro Gln	
165 170	
Tyr Phe Thr Phe Asp Leu Thr Ala Leu Lys	
175 180	
Leu Ile Thr Gln Pro Leu Pro Ala Ala Thr	
185 190	
Trp Thr Asp Asp Thr Pro Thr Gly Ser Asn	
195 200	
Gly Ala Leu Arg Pro Gly Ile Ser Phe His	
205 210	

35

Pro Lys Leu Arg	Pro Ile Leu Leu Pro Asn	
	215	220
Lys Ser Gly Lys	Lys Gly Asn Ser Ala Asp	
	225	230
Leu Thr Ser Pro	Glu Lys Ile Gln Ala Ile	
	235	240
Met Thr Ser Leu	Gln Asp Phe Lys Ile Val	
	245	250
Pro Ile Asp Pro	Thr Lys Asn Ile Met Gly	
	255	260
Ile Glu Val Pro	Glu Thr Leu Val His Lys	
	265	270
Leu Thr Gly Lys	Lys Val Thr Ser Lys Asn	
	275	280
Gly Gln Pro Ile	Ile Pro Val Leu Leu Pro	
	285	290
Lys Tyr Ile Gly	Leu Asp Pro Val Ala Pro	
	295	300
Gly Asp Leu Thr	Met Val Ile Thr Gln Asp	
	305	310
Cys Asp Thr Cys	His Ser Pro Ala Ser Leu	315
320Pro Ala Val	Ile Glu Lys	
	325	

<210> 23

<211> 288

<212> PRT

<213> Ebola Zaire

<400> 23

Met Glu Ala Ser Tyr Glu Arg Gly Arg Pro	
1	5 10
Arg Ala Ala Arg Gln His Ser Arg Asp Gly	
	15 20
His Asp His His Val Arg Ala Arg Ser Ser	
	25 30
Ser Arg Glu Asn Tyr Arg Gly Glu Tyr Arg	
	35 40
Gln Ser Arg Ser Ala Ser Gln Val Arg Val	
	45 50
Pro Thr Val Phe His Lys Lys Arg Val Glu	
	55 60
Pro Leu Thr Val Pro Pro Ala Pro Lys Asp	
	65 70
Ile Cys Pro Thr Leu Lys Lys Gly Phe Leu	
	75 80
Cys Asp Ser Ser Phe Cys Lys Lys Asp His	
	85 90
Gln Leu Glu Ser Leu Thr Asp Arg Glu Leu	
	95 100
Leu Leu Leu Ile Ala Arg Lys Thr Cys Gly	
	105 110
Ser Val Glu Gln Gln Leu Asn Ile Thr Ala	
	115 120
Pro Lys Asp Ser Arg Leu Ala Asn Pro Thr	
	125 130
Ala Asp Asp Phe Gln Gln Glu Glu Gly Pro	

	135	140
Lys Ile Thr Leu	Leu Thr Leu Ile Lys Thr	
	145	150
Ala Glu His Trp	Ala Arg Gln Asp Ile Arg	
	155	160
Thr Ile Glu Asp	Ser Lys Leu Arg Ala Leu	
	165	170
Leu Thr Leu Cys	Ala Val Met Thr Arg Lys	
	175	180
Phe Ser Lys Ser	Gln Leu Ser Leu Leu Cys	
	185	190
Glu Thr His Leu	Arg Arg Glu Gly Leu Gly	
	195	200
Gln Asp Gln Ala	Glu Pro Val Leu Glu Val	
	205	210
Tyr Gln Arg Leu	His Ser Asp Lys Gly Gly	
	215	220
Ser Phe Glu Ala	Ala Leu Trp Gln Gln Trp	
	225	230
Asp Arg Gln Ser	Leu Ile Met Phe Ile Thr	
	235	240
Ala Phe Leu Asn	Ile Ala Leu Gln Leu Pro	
	245	250
Cys Glu Ser Ser	Ala Val Val Val Ser Gly	
	255	260
Leu Arg Thr Leu	Val Pro Gln Ser Asp Asn	
	265	270
Glu Glu Ala Ser	Thr Asn Pro Gly Thr Cys	275
280Ser Trp Ser	Asp Glu Gly Thr Pro	285
<210> 24<211> 11<212> PRT<213> Ebola Zaire<400> 24Val Tyr Gln Val Asn Asn Leu		
Glu Glu Ile		
1	5	10
Cys		
<210> 25		
<211> 23		
<212> PRT		
<213> Ebola Zaire		
<400> 25		
Leu Lys Phe Ile	Asn Lys Leu Asp Ala Leu	
1	5	10
Leu Val Val Asn	Tyr Asn Gly Leu Leu Ser	
	15	20
Ser Ile Phe		
51		